

OHIO MATCH ROAD WATER DISTRICT (PWSNO 1280128) SOURCE WATER ASSESSMENT REPORT

November 26, 2001



State of Idaho Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This risk assessment is based on a land use inventory in the well recharge zone, sensitivity factors associated with how the well was constructed, and aquifer characteristics.

This report, *Source Water Assessment for Ohio Match Road Water District*, describes the public drinking water well; the well recharge zone and potential contaminant sites located inside the recharge zone boundaries.

This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this public water system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

Ohio Match Road Water District drinking water is supplied by a 317 foot deep well pumping from the Rathdrum Prairie Aquifer. The water system serves a population of about 225 people in a rural residential area between Garwood and Chilco in Kootenai County, Idaho. Historically, Ohio Match Road Water District has had few water quality problems. A groundwater Susceptibility Analysis conducted by DEQ May 15, 2001 found the well to be at moderate risk for contamination, mostly because of natural factors associated with local geology.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Source water protection activities for Ohio Match Road Water District should incorporate a variety of strategies. The District maintains a fenced well lot free from the use or storage of materials hazardous to ground water. are used or stored. The district needs to continue to promote back flow prevention through articles in the district newsletter or brochures mailed with water bills. Public education efforts about other topics pertaining to prevention of ground water pollution, such a proper septic system maintenance, should be directed toward water users.

Because 186 public water systems in Idaho draw water from the Rathdrum Prairie Aquifer, they should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures. Partnerships with state and local agencies and industry groups should also be established.

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. For assistance in developing protection strategies, please contact your regional Department of Environmental Quality office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR OHIO MATCH ROAD WATER DISTRICT

Section 1. Introduction - Basis for Assessment

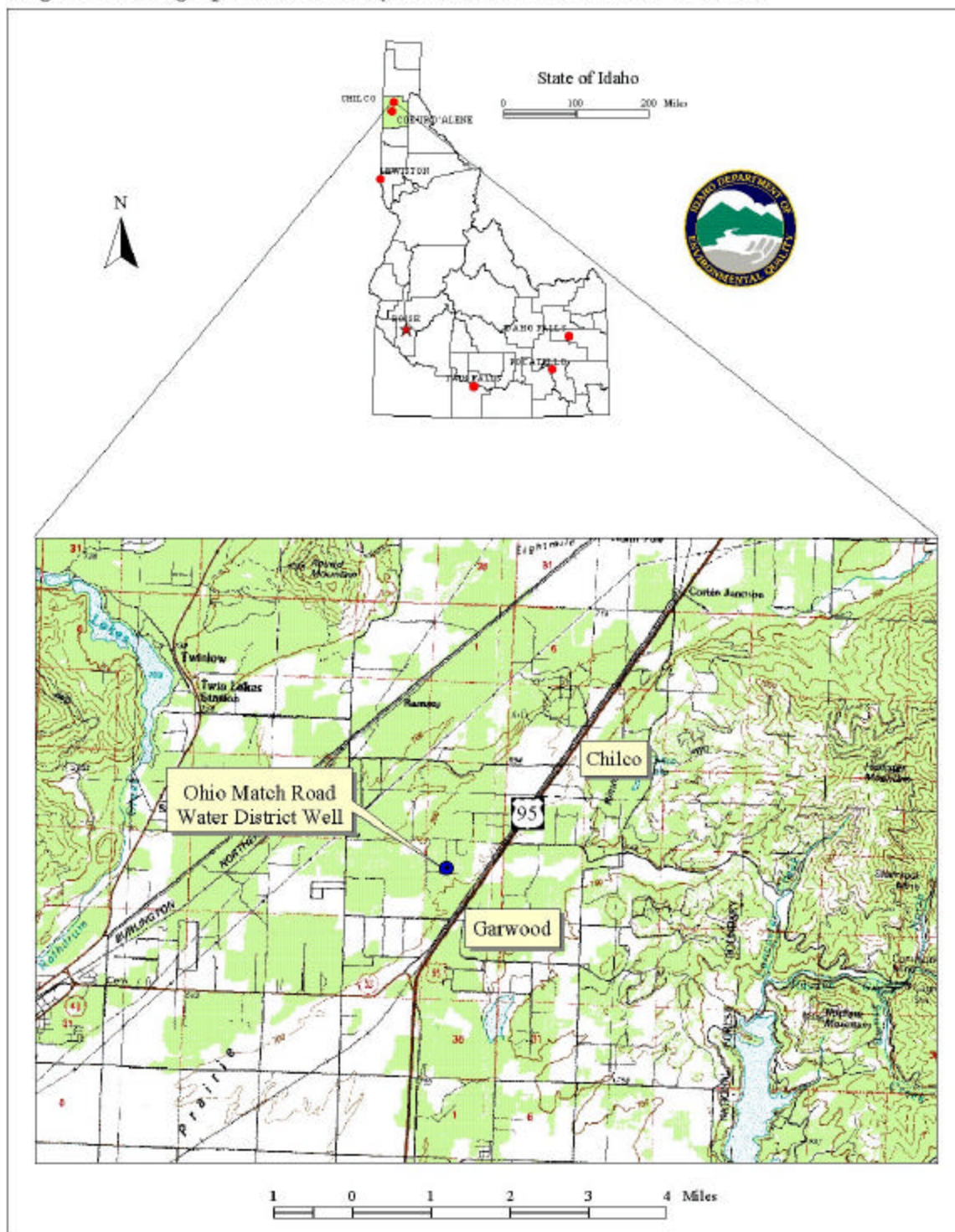
The following sections contain information necessary for understanding how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and an inventory of significant potential sources of contamination identified within that area are included. The ground water susceptibility analysis worksheets used to develop this assessment are attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess every public drinking water source in Idaho for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. These assessments are based on a land use inventory inside the delineated recharge zones, sensitivity factors associated with how the well is constructed, and aquifer characteristics. The state must complete more than 2900 assessments by May of 2003. Because resources and the time available to accomplish assessments are limited, an in-depth, site-specific investigation for every public water system is not possible.

The results of the source water assessment should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system The ultimate goal of this assessment is to provide data to local communities for developing a protection strategy for their drinking water supply. The Idaho Department of Environmental Quality recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Figure 1. Geographic Location of Ohio Match Road Water District.



Section 2. Preparing for the Assessment

Defining the Zones of Contribution - Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the well recharge area into time of travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer.

DEQ used a refined computer model approved by the EPA to determine the time of travel (TOT) for water Ohio Match Road Water District pumps from the Rathdrum Prairie Aquifer. The computer model used data assimilated by DEQ from a variety of sources including the well log for Ohio Match Road Water District Well #1.

Ohio Match Road Water District serves a rural residential community of approximately 225 people located west of Highway 95 in the vicinity of Garwood, Idaho (Figure 1). Public drinking water for Ohio Match Road Water District customers is supplied by a 317-foot deep well.

The delineated source water assessment area for Ohio Match Road Water District is a narrow corridor about two thirds of a mile long stretching north eastward from the well. (Figure 2). The delineation is divided into three time-of-travel zones: 0-3 years, 3 to 6 years and 6 to 10 years.

Identifying Potential Sources of Contamination

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Inventories for public water systems in Idaho were conducted in two-phases. The first phase involved identifying and documenting potential contaminant sources within the source water assessment areas through the use of computer databases and Geographic Information System maps developed by DEQ. Jim Katayama documented additional sites in the vicinity of the Ohio Match Road Water District well during the second or enhanced phase of the potential contaminant inventory

Figure 2, *Ohio Match Road Water District Delineation and Potential Contaminant Inventory* on page 7 of this report shows the location of the Ohio Match Road Water District well, and the zones of contribution DEQ delineated for it. Land use in the well recharge zone is mostly low-density rural residential. The recharge delineation ends near a railroad and Highway 95. There is a post/pole and wood treatment facility about 100 yards south of the 10-year time of travel zone for the well. Homes in the area have residential septic systems. Table 2 on page 8 of this report summarizes information about potential contaminant sites numbered on the map.

Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. When a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation.

Section 3. Susceptibility Analysis

The susceptibility to contamination of all groundwater sources in Idaho is being assessed on the following factors:

- physical integrity of the well,
- hydrologic characteristics,
- land use characteristics, and potentially significant contaminant sources
- historic water quality

The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. A high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking. The Susceptibility Analysis Worksheet for the Ohio Match Road Water District well, Attachment A, shows in detail how the well scored.

Well Construction

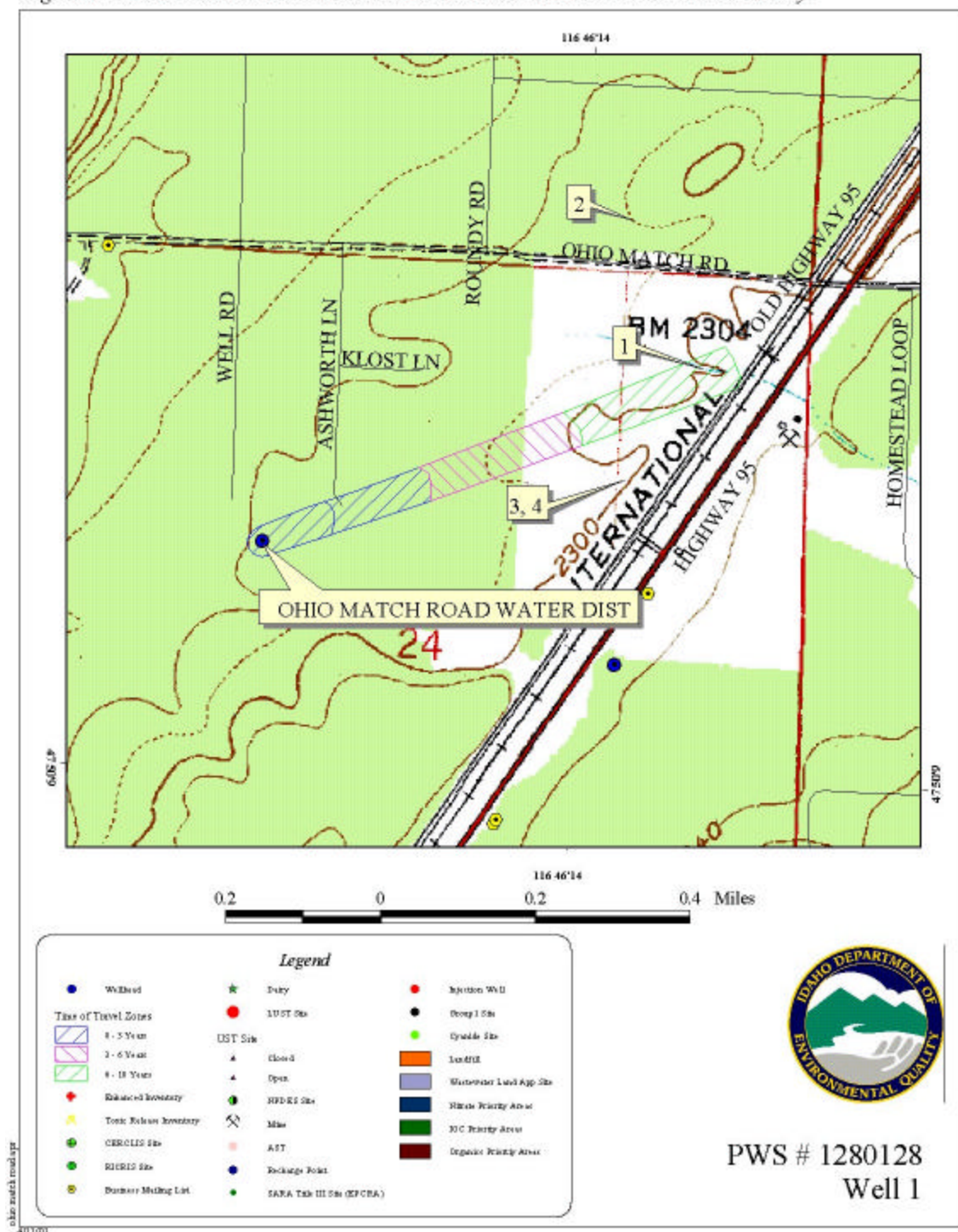
Well construction directly affects the ability of the well to protect the aquifer from contaminants. Lower scores imply a well that can better protect the water. This portion of the susceptibility analysis relies on information from individual well logs and from the most recent sanitary survey of the public water system.

The Ohio Match Road Water District drinking water system has single well extracting ground water for irrigation and domestic uses. No treatment of the water is needed before it is distributed. Well #1 was drilled in January 1981 to a depth of 317 feet. The well has an 8-inch casing with a wall thickness of 0.25 inches. Current Idaho Department of Water Resources regulations require a minimum thickness of 0.28 inches for 8-inch diameter steel casing. The well seal, extending about 20 feet below the surface into a layer of large gravel, is the required depth. However, points were marked against the well because the seal and casing terminate in permeable, unconsolidated soil strata typical of the Rathdrum Prairie Aquifer. Table 1 summarizes construction and site characteristics for the well.

Table 1. Selected Construction Characteristics of Ohio Match Road Water District Well

Well	Total Depth (ft.)	Depth of Surface Seal (ft)	Depth of Casing (ft)	Well Screen Depth Range (ft)	Static Water Level (ft)
Well #1	317	20	306	281-301	251

Figure 2. Ohio Match Road Water District Delineation and Potential Contaminant Inventory.



Hydrologic Sensitivity

The hydrologic sensitivity score for the Ohio Match Road Water District Well #1 was six points out six points possible. The score reflects natural geologic conditions at the well site and in the recharge zone. The depth to first ground water is less than 300 feet. Sand, gravel and cobbles predominate in the soil strata between the topsoil and the water table. There is not a significant clay layer retarding the vertical transport of contaminants.

The soils in the recharge zone as a whole are well drained. Poorly drained to moderately well drained soils are deemed more protective of ground water than soils which drain faster.

Potential Contaminant Sources and Land Use

Land use within The Ohio Match Road Water District well recharge zone is mostly rural residential. Locations of houses and septic systems relative to the well are not documented in the public water system file. Highway 95 and a railroad are near the 10-year time of travel zone delineated for the well. A post/pole and wood treatment plant are about 100 yards south of the delineation boundary. There a gravel pit approximately 300 yards north of the 10-year time-of-travel boundary;

Table 2. Ohio Match Road Water District Potential Contaminant Inventory

MAP ID NUMBER	SITE DESCRIPTION	SOURCE OF INFORMATION	POTENTIAL CONTAMINANTS ¹
1	Ephemeral Stream	USGS	IOC, SOC, VOC, Microbial
2	Gravel Pit	Enhanced Inventory	Ponded water, illegal dumping
3	Post /Pole manufacturing	Enhanced Inventory	IOC, SOC, VOC
4	Wood Treatment	Enhanced Inventory	IOC, SOC, VOC

¹ IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Historic Water Quality

Historically, Ohio Match Road Water District has had few water quality problems. Positive bacterial samples on record for October 1992 and February and September 1994 were from sites in the distribution system, rather than from the well. Nitrate concentrations rose from 0.62 mg/l in 1984 to 2.72 mg/l in 1993. The concentrations declined to 0.70 mg/l in annual samples tested in 1999 and 2000. The Maximum Contaminant Level (MCL) for nitrate is 10 mg/l.

Synthetic organic compounds and volatile organic compounds have never been detected in the well. Radiological contaminants in concentrations far below MCL have been present since testing began in 1981.

Final Susceptibility Ranking

The Ohio Match Road Water District well ranked moderately susceptible to all classes of regulated contaminants, mostly because of natural geologic conditions associated with the Rathdrum Prairie Aquifer. Total scores for each contaminant category are summarized on Table 3. The complete susceptibility analysis worksheet for the well can be found in Attachment A.

The final scores for the susceptibility analysis were determined using the following formulas:

- 1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
- 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

The final ranking categories are as follows:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

Table 3. Summary of Ohio Match Road Water District Susceptibility Evaluation

Cumulative Susceptibility Scores						
Well Name	System Construction	Hydrologic Sensitivity	Contaminant Inventory			
			IOC	VOC	SOC	Microbial
Well #1	4	6	0	0	0	0
Final Susceptibility Ranking						
	IOC	VOC	SOC	Microbial		
Well #1	Moderate	Moderate	Moderate	Moderate		

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

HIGH* - Indicates source automatically scored as high susceptibility due to presence of bacteria or a VOC, SOC or an IOC above the maximum contaminant level in the tested drinking water

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. The state and local health districts have instituted enhanced protection of the ground water in the Rathdrum Prairie Aquifer because of its high use and uniquely pristine water quality. The protections are generally aquifer wide and are not aimed at zones of contribution to a specific well or water system. *The Spokane Valley-Rathdrum Prairie Atlas*, sent to water systems on the prairie when they were invited to perform an enhanced contaminant inventory, describes some of the regional protection measures.

The 186 public water systems in Idaho that draw water from the Rathdrum Prairie Aquifer should consider forming a regional group to represent their interests before state, county and municipal governing bodies when regulatory tools like zoning overlays, or enactment of building codes are the most appropriate ground water protection measures. These types of measures could be used to protect the capture zones of a specific system or group of wells that could be put at risk from local land use changes.

In its own service area, Ohio Match Road Water District maintains a fenced area around the well, well house and reservoir to restrict access in the sanitary setback zone. The district needs to continue to encourage use of back flow prevention devices, particularly for automatic sprinkler systems and stock tanks. Water users can be invited to participate in voluntary ground water protection activities like household hazardous materials collection days. The district should also promote proper septic tank maintenance as a water protection measure.

Partnerships with state and local agencies and industry groups should also be established. For instance, source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, local Soil Conservation District, and the Natural Resources Conservation Service. Water district officials may want to visit with the wood treatment plant managers to let them know how close they are to a community water well and to encourage best management practices at the plant for prevention of ground water contamination.

Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

Assistance

Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional DEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: <http://www.deq.state.id.us>

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at (208) 343-7001 for assistance with wellhead protection strategies.

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Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

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Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

Attachment A

Ohio Match Road Water District Susceptibility Analysis Worksheets

Ground Water Susceptibility Analysis

Public Water System Name : **OHIO MATCH ROAD WATER DIST**

Source: **WELL #1**

Public Water System Number : **1280128**

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1. System Construction		SCORE			
Drill Date	1/13/01				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2000			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		6			
		IOC	VOC	SOC	Microbial
3. Potential Contaminant / Land Use - ZONE 1A (Sanitary Setback)		Score	Score	Score	Score
Land Use Zone 1A	RANGELAND, WOODLAND, PASTURE	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		0	0	0	0
Potential Contaminant / Land Use - ZONE 1B (3 YR. TOT)					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		0	0	0	0
Potential Contaminant / Land Use - ZONE II (6 YR. TOT)					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III (10 YR. TOT)					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of Zone	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	0	0	0
Cumulative Potential Contaminant / Land Use Score		0	0	0	0
4. Final Susceptibility Source Score		10	10	10	10
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

POTENTIAL CONTAMINANT INVENTORY

LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as **Superfund** is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100-year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.